

### **Remarks**

Claims 1, 7, 22-27, 29-34, 37, 39, 41-49, 51, 52, and 57-65 are pending. Claims 2-6, 8-21, 28, 35, 36, 38, 40, 50, and 53-56 have been canceled without prejudice. Claims 1, 7, 23-27, 30-33, 43 and 57 have been amended. Support for the claim amendments can be found throughout the application as filed. Therefore, no new matter has been added. Favorable reconsideration is respectfully requested in view of the foregoing amendments and following remarks.

### **Claim Objections**

Claim 7 has been objected to because it is dependent from a cancelled claim. Claim 7 was dependent from cancelled claim 6, which was dependent from cancelled claim 5, which in turn was dependent from claim 1. The limitations of claims 5 and 6 have been incorporated into claim 1 in previous amendments. Claim 7 has been amended to depend directly from claim 1. No new matter has been added.

### **Claim Rejections – 35 USC § 112¶2**

*Regarding claims 1, 7, 22-27, 29-34, 37, 39, 41-42, 51, 57, 60-61, and 63-64*

Claims 1, 7, 22-27, 29-34, 37, 39, 41-42, 51, 57, 60-61, and 63-64 have been rejected under 35 U.S.C. 112, second paragraph, as being indefinite. The Examiner states that the rejected claims fail to particularly point out and distinctly claim the subject matter which the Applicant regards as the invention.

Independent claims 1 and 27 have been amended. Claims 7, 22-26, 29-34, 37, 39, 41-42, 51, 57, 60-61, and 63-64 directly or indirectly depend from claim 1 or claim 27. Paragraph [0011] of the Specification states that “heteroarylene means a divalent heteroaromatic group such as pyrrolene, furanylene, thiophenylene, pyridinylene, etc.” The rejected claims have been amended to reflect the names of the four exemplary heteroarylene groups explicitly cited in the Specification. Therefore, no new matter has been added.

*Regarding claims 43-49, 62, and 65*

Claims 43-49, 62, and 65 have been rejected under 35 U.S.C. 112, second paragraph, as being indefinite. The Examiner states that the rejected claims fail to particularly point out and distinctly claim the subject matter which the Applicant regards as the invention.

Independent claim 43 has been amended to remove “H” from the definition of R<sub>3</sub>. The definitions of R<sub>1</sub>, R<sub>2</sub>, R<sub>4</sub> and R<sub>5</sub> remain unchanged. Therefore, no new matter has been added.

The Applicants respectfully contend that the phrase “carbon-containing group” is not indefinite because “the [rejected] claims set out and circumscribe a particular subject matter with a reasonable degree of clarity and particularity.” MPEP § 2173.02. For example, at paragraph [0023] the Specification provide a non-exhaustive list of exemplary carbon-containing groups. The Applicants respectfully contend that one of skill in the art, informed by the aforementioned examples, would conclude that the rejected claims “define the patentable subject matter with a reasonable degree of particularity and distinctness.” See MPEP § 2173.02 (“Some latitude in the manner of expression and the aptness of terms should be permitted even though the claim language is not as precise as the examiner might desire. Examiners are encouraged to suggest claim language to applicants to improve the clarity or precision of the language used, but should not reject claims or insist on their own preferences if other modes of expression selected by applicants satisfy the statutory requirement.”).

Moreover, “a claim term that is not used or defined in the specification is not indefinite if the meaning of the claim term is discernible. *Bancorp Services, L.L.C. v. Hartford Life Ins. Co.*, 359 F.3d 1367, 1372, 69 USPQ2d 1996, 1999-2000 (Fed. Cir. 2004) (holding that the disputed claim term ‘surrender value protected investment credits’ which was not defined or used in the specification was discernible and hence not indefinite because ‘the components of the term have well recognized meanings, which allow the reader to infer the meaning of the entire phrase with reasonable confidence’).” MPEP § 2173.02. In contrast, the rejected claim term (i.e., “carbon-containing group”) is used and partially defined in the instant Specification; in other words, the instant application provides more guidance as to the meaning of the term “carbon-containing group” than was given for the rejected terms in the application that was the subject of *Bancorp Services*, in which case the Federal Circuit held that the rejected claims complied with the requirements of 35 USC 112¶2. Consequently, the Applicants respectfully contend that the rejected claims in the instant application comply with the requirements of 35 USC 112¶2.

Claims 44-49, 62, and 65 depend, directly or indirectly, from amended claim 43. Accordingly, the Applicants respectfully contend that all of the rejected claims are definite.

### **Claim Rejections – 35 USC § 103(a)**

#### Regarding Claims 1, 7, 22-26, 37, 39, 41-42, 51, 57, 60, and 63

Claims 1, 7, 22-26, 37, 39, 41-42, 51, 57, 60, and 63 stand r ejected under 35 U.S.C. 103(a) as being unpatentable over Kaneko et al. (JP08-030013). Claim 1 is an independent claim from which the remaining claims in this group depend directly or indirectly. The Applicants respectfully traverse.

To establish a *prima facie* case of obviousness, a number of criteria must be met. For example, all of the limitations of a rejected claim must be taught or suggested in the references relied upon by the Examiner; or they must be among the variations that would have been “obvious to try” to one of ordinary skill in the relevant art in light of the cited references. Moreover, one of ordinary skill in the relevant art must have a reasonable expectation of success in light of the cited reference(s). Importantly, the reasonable expectation of success must be found in the prior art, and may not be based on the Applicant’s disclosure. In re Vaeck, 947 F.2d 488, 20 U.S.P.Q. 2d 1438 (Fed. Cir. 1991); see MPEP § 2143 - § 2143.03 for decisions pertinent to each of these criteria.

#### *Kaneko is nonanalogous art*

Kaneko describes a method of recording and removing images from a substrate. Therefore, the reference is nonanalogous art vis-à-vis the claimed ionic liquid compositions because the reference advanced by the Examiner does not relate to “any need or problem known in the field of [ionic liquids] at the time of the invention and addressed by” the instant application. See MPEP § 2141.01(a). Furthermore, while not dispositive of an assessment of analogy, the Applicants note that Kaneko has been assigned to Int. Cl. G03G “Electrography; Electrophotography; Magnetography,” subclasses 7/00 “Selection of materials for use in image-receiving members, i.e. for reversal by physical contact; Manufacture thereof” and 21/00 “Arrangements not provided for by groups 13/00 to 19/00, e.g. cleaning, elimination of residual charge.” In stark contrast, the present application has been assigned to Int. Cl. C07C “Acyclic or carbocyclic compounds,” subclass 39/44 “Metal derivatives of a hydroxy group bound to a

carbon atom of a six-membered aromatic ring.” The Patent Office classification of references can and does, in this case, provide some evidence of “nonanalogy.” See MPEP § 2141.01(a).

Further, an assessment of the similarities and differences in structure and function of the claimed invention and the teachings of the cited reference should carry even greater weight in establishing the “nonanalogy” of the cited reference. MPEP § 2141.01(a). The structural differences between the image removal liquid described in Kaneko and the compositions of the present invention are significant. Specifically, one of ordinary skill in the art would understand that having “water as the base as a principal component” (Kaneko, paragraph [0008]) would entail having more water present in the solution than any other single component. In contrast, rejected claim 1 states that the ionic liquid must be present in at least 70% by weight of the composition. This leaves at most 30% water by weight in the claimed compositions. Even if one assumes that the composition comprises no other components, the maximum amount water (30%) would not be considered by one of ordinary skill in the art to be the “principal component” of the claimed compositions. Additionally, the function of the claimed invention differs from that of the compositions cited in Kaneko. The problem addressed in Kaneko is that of providing an improved method and device for regenerating a material to be recorded. In contrast, the problem addressed in the present application is the discovery and manufacture of new ionic liquid compositions with water as an minority if not incidental constituent. Importantly, Kaneko stresses the importance of the presence of water in order to carry out the specific function of the image removal accelerating liquid. The requirement for lesser amounts of water in the claimed ionic liquid compositions would discourage one of skill in the art of ionic liquids from looking to Kaneko for guidance as to how to make and use the subject matter of the rejected claims.

Therefore, the Applicants respectfully contend that Kaneko is not available to the Examiner because it does not relate to analogous art. In the absence of Kaneko, the Applicants respectfully contend that the Examiner has failed to state a *prima facie* case of obviousness for the pending claims.

*Kaneko does not teach each and every element of the claimed invention*

Assuming, *arguendo*, that Kaneko is available as an analogous prior art reference, which the Applicants do not believe to be the case, the Applicants contend that Kaneko does not teach all of the limitations of rejected claim 1, and the claims dependent therefrom.

One of ordinary skill in the art would understand Kaneko's explicit requirement for having "water as the base as a principal component" would entail having more water present in the solution than any other single component. Claim 1 clearly states that the ionic liquid must be present in at least 70% by weight of the composition. This limitation leaves at most 30% water by weight in the claimed compositions. Assuming that no other components of the composition are present, the maximum amount of water (30%) that could be present would not be considered by one of ordinary skill in the art to be a "principal component" of the claimed compositions. Therefore, Kaneko explicit requirement for water as the principal component renders it lacking with respect the literal scope of the rejected claims. Moreover, because Kaneko explicitly requires that water must be the principal component of its compositions, one of ordinary skill in the art would not considered it "obvious to try" modifying Kaneko's compositions to include no more than 30% water.

Furthermore, claim 23 is directed to an ionic liquid comprising heteroaromatic quaternary ammonium cations. Kaneko does not teach heteroaromatic quaternary ammonium cations. Kaneko teaches only cations of formula (2), wherein the R<sub>3</sub>, R<sub>4</sub>, R<sub>5</sub>, and R<sub>6</sub> substituents on nitrogen are "hydrogen, an alkyl group of carbon numbers 1-4, a hydroxyalkyl group, [or] an alkyl halide group."

Moreover, claim 24 is directed to an ionic liquid comprising quaternary ammonium cations substituted by groups selected from the group consisting of alkyl consisting of from about six to about eighteen carbon atoms and aryl groups. Kaneko does not teach or suggest these cations. Kaneko teaches only cations of formula (2), wherein the R<sub>3</sub>, R<sub>4</sub>, R<sub>5</sub>, and R<sub>6</sub> substituents on nitrogen are "hydrogen, an alkyl group of carbon numbers 1-4, a hydroxyalkyl group, [or] an alkyl halide group." Tetrabutylammonium (R = C<sub>4</sub>H<sub>9</sub>) hydroxide, for example, is a well-known phase transfer catalyst, indicating the amphiphilic nature of the molecule even with lower alkyl substitution. Because the image removal accelerating liquid of Kaneko contains water as its principal component, increasing the

number of carbon atoms in the alkyl substituents of the cation would not have been an obvious variation to one of ordinary skill in the art, as the solubility of such cations in water would decrease significantly.

Additionally, claim 25 is directed to an ionic liquid comprising 1-butyl-3-methylimidazolium. Kaneko does not teach this cation or any reasonable structural variation thereof.

Claim 39 is directed to a hydrophobic ionic liquid. Kaneko stresses the importance of the presence of water in the image removal promotion liquids described in JP08-030013. Paragraph [0008] of Kaneko describes the solutions as “[using] water as the base as a principal component.” One of ordinary skill in the relevant art would know, or be able to deduce, that a “hydrophobic ionic liquid” of the present invention would not form a solution having water as the principal component. Furthermore, Kaneko describes the “sulfo succinate” moieties as “surfactants” [paragraph 0008]. It is well-understood by those of ordinary skill in the art that while surfactants, by definition, contain a hydrophobic region, they are not themselves “hydrophobic,” as the present claims require.

Also, claim 51 is directed to a molten salt. Kaneko teaches solutions of ions in water; Kaneko does not teach the molten form of a salt, regardless of the melting point.

Moreover, claim 57 is directed to an ionic liquid that melts at a temperature range that is greater than about 40 °C but less than about 80 °C. Kaneko teaches solutions of ions in water; Kaneko does not teach the molten form of a salt, regardless of the melting point.

Furthermore, claim 60 is directed to a composition comprising greater than 80 weight percent of the ionic liquid. The arguments made above pertaining to the effect of having at least 70 percent by weight of the ionic liquid are reiterated by reference. One of ordinary skill in the art would understand that having “water as the base as a principal component” would entail having more water present in the solution than any other single component. Claim 60 clearly states that the ionic liquid must be present in at least 80% by weight of the composition. This limitation allows for at most 20% water by weight in the claimed compositions. Assuming that no other components of the composition are present, 20% water would not be considered by one of ordinary skill in the art to render water a “principal

component” of the compositions. Kaneko, therefore, does not teach each and every element of claims 1, 7, 22-26, 37, 39, 41-42, 51, 57, 60, and 63.

*Kaneko does not provide a reasonable expectation of success*

As noted above, one of ordinary skill in the relevant art must have a reasonable expectation of success in light of the cited reference(s). Importantly, the reasonable expectation of success must be found in the prior art, and may not be based on the Applicant’s disclosure.

The many differences between a solution of ions and an ionic liquid are appreciated by one of ordinary skill in the art. For example, one of ordinary skill in the art appreciates that the mere existence of an aqueous solution of two particular ions does not guarantee that the two particular ions in their neat form will display the uncommon properties of an ionic liquid. For example, a room-temperature solution of sodium chloride in water does not provide a reasonable expectation of success in preparing a room-temperature sodium chloride-based ionic liquid; one of ordinary skill in the art can appreciate this fact because there is no such room-temperature ionic liquid reported in the scientific literature.

Further, one of ordinary skill in the art would understand Kaneko’s statement that having “water as the base as a principal component” (paragraph [0008]) would entail having more water present in the solution than any other single component. Kaneko repeatedly stresses the importance of water in the composition – “the image removal promotion liquid containing alkyl sulfo succinate has the *high wettability* to the image formation matter and a recorded material, *osmosis* in a recorded material arises promptly and one of the reasons alkyl sulfo succinate gives the removal property of the good image formation matter is guessed for image removal promotion liquid to permeate even the interface of the image formation matter and a recorded material especially” (paragraph [0013], emphasis added). Furthermore, “when giving the image removal promotion liquid *with which water is especially contained*...to the recorded material in large quantities, ... the component of the image removal promotion liquid given to the recorded material, *especially water*[,] weaken[s] the adhesive strength of [the] recorded material and the image formation matter...” (paragraph [0013], emphasis added). Claim 1, however, clearly states that the ionic liquid must be present in at least 70% by weight of the composition. Kaneko teaches away from the reduction of the quantity of water by stressing its importance in the

compositions. It is well understood that the function of the compositions recited in Kaneko would change significantly were the quantity of water to be decreased. Accordingly, the Applicants respectfully contend that one of ordinary skill in the art would not have had a reasonable expectation of success in developing the claimed invention based on the teachings of Kaneko.

Consequently, the Applicants respectfully submit that the Examiner has failed to state a *prima facie* case of obviousness for the rejected claims. Withdrawal of the rejection of claims 1, 7, 22-26, 37, 39, 41-42, 51, 57, 60, and 63 is respectfully requested.

Regarding Claims 27, 29-34, 61, and 64

Claims 27, 29-34, 61, and 64 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Kaneko et al. (JP08-030013). Claim 27 is an independent claim from which the remaining claims in this group depend directly or indirectly. The Applicants respectfully traverse.

To establish a *prima facie* case of obviousness, a number of criteria must be met. For example, all of the limitations of a rejected claim must be taught or suggested in the references relied upon by the Examiner; or they must be among the variations that would have been “obvious to try” to one of ordinary skill in the relevant art in light of the cited references. Moreover, one of ordinary skill in the relevant art must have a reasonable expectation of success in light of the cited reference(s). Importantly, the reasonable expectation of success must be found in the prior art, and may not be based on the Applicant’s disclosure. In re Vaeck, 947 F.2d 488, 20 U.S.P.Q. 2d 1438 (Fed. Cir. 1991); see MPEP § 2143 - § 2143.03 for decisions pertinent to each of these criteria.

*Kaneko is nonanalogous art*

Kaneko describes a method of recording and removing images from a substrate. Therefore, the reference is nonanalogous art vis-à-vis the claimed ionic liquid compositions because the reference advanced by the Examiner does not relate to “any need or problem known in the field of [ionic liquids] at the time of the invention and addressed by” the instant application. See MPEP § 2141.01(a). Furthermore, while not dispositive of an assessment of analogy, the Applicants note that Kaneko has been assigned to Int. Cl. G03G “Electrography;



Electrophotography; Magnetography,” subclasses 7/00 “Selection of materials for use in image-receiving members, i.e. for reversal by physical contact; Manufacture thereof” and 21/00 “Arrangements not provided for by groups 13/00 to 19/00, e.g. cleaning, elimination of residual charge.” In stark contrast, the present application has been assigned to Int. Cl. C07C “Acyclic or carbocyclic compounds,” subclass 39/44 “Metal derivatives of a hydroxy group bound to a carbon atom of a six-membered aromatic ring.” The Patent Office classification of references can and does, in this case, provide some evidence of “nonanalogy.” See MPEP § 2141.01(a).

Further, an assessment of the similarities and differences in structure and function of the claimed invention and the teachings of the cited reference should carry even greater weight in establishing the “nonanalogy” of the cited reference. MPEP § 2141.01(a). The structural differences between the image removal liquid described in Kaneko and the compositions of the present invention are significant. Specifically, one of ordinary skill in the art would understand that having “water as the base as a principal component” (Kaneko, paragraph [0008]) would entail having more water present in the solution than any other single component. In contrast, rejected claim 27 states that the ionic liquid must be present in at least 70% by weight of the composition. This leaves at most 30% water by weight in the claimed compositions. Even if one assumes that the composition comprises no other components, the maximum amount water (30%) would not be considered by one of ordinary skill in the art to be the “principal component” of the claimed compositions. Additionally, the function of the claimed invention differs from that of the compositions cited in Kaneko. The problem addressed in Kaneko is that of providing an improved method and device for regenerating a material to be recorded. In contrast, the problem addressed in the present application is the discovery and manufacture of new ionic liquid compositions with water as a minority if not incidental constituent. Importantly, Kaneko stresses the importance of the presence of water in order to carry out the specific function of the image removal accelerating liquid. The requirement for lesser amounts of water in the claimed ionic liquid compositions would discourage one of skill in the art of ionic liquids from looking to Kaneko for guidance as to how to make and use the subject matter of the rejected claims.

Therefore, the Applicants respectfully contend that Kaneko is not available to the Examiner because it does not relate to analogous art. In the absence of Kaneko, the Applicants

respectfully contend that the Examiner has failed to state a *prima facie* case of obviousness for the pending claims.

*Kaneko does not teach each and every element of the claimed invention*

Assuming, *arguendo*, that Kaneko is available as a prior art reference, which the Applicants do not believe to be the case, the Applicants contend that Kaneko does not teach all of the limitations of the rejected claims. Specifically, independent claim 27 is limited to a “hydrophobic ionic liquid.” Kaneko stresses the importance of the presence of water in the image removal promotion liquids described in JP08-030013. Paragraph [0008] of Kaneko describes the solutions as “[using] water as the base as a principal component.” One of ordinary skill in the relevant art would know, or be able to deduce, that a solution having water as the principal component would not constitute a “hydrophobic ionic liquid.” Furthermore, Kaneko describes the “sulfo succinate” moieties as “surfactants” [paragraph 0008]; it is well-understood by those of ordinary skill in the art that while surfactants, by definition, contain a hydrophobic region, they are not themselves “hydrophobic,” as the present claims require.

One of ordinary skill in the art would understand Kaneko’s explicit requirement for having “water as the base as a principal component” would entail having more water present in the solution than any other single component. Claim 27 clearly states that the ionic liquid must be present in at least 70% by weight of the composition. This limitation leaves at most 30% water by weight in the claimed compositions. Assuming that no other components of the composition are present, the maximum amount of water (30%) that could be present would not be considered by one of ordinary skill in the art to be a “principal component” of the claimed compositions. Therefore, Kaneko explicit requirement for water as the principal component renders it lacking with respect to the literal scope of the rejected claims. Moreover, because Kaneko explicitly requires that water must be the principal component of its compositions, one of ordinary skill in the art would not consider it “obvious to try” modifying Kaneko’s compositions to include no more than 30% water.

Furthermore, claim 30 is directed to an ionic liquid comprising heteroaromatic quaternary ammonium cations. Kaneko does not teach heteroaromatic quaternary ammonium cations. Kaneko teaches only cations of formula (2), wherein the R<sub>3</sub>, R<sub>4</sub>, R<sub>5</sub>, and

R<sub>6</sub> substituents on nitrogen are “hydrogen, an alkyl group of carbon numbers 1-4, a hydroxyalkyl group, [or] an alkyl halide group.”

Additionally, claim 32 is directed to an ionic liquid comprising 1-butyl-3-methylimidazolium. Kaneko does not teach this cation or any reasonable structural variation thereof.

Furthermore, claim 61 is directed to a composition comprising greater than 80 weight percent of the ionic liquid. The arguments made above pertaining to the effect of having at least 70 percent by weight of the ionic liquid are reiterated by reference. One of ordinary skill in the art would understand that having “water as the base as a principal component” would entail having more water present in the solution than any other single component. Claim 61 clearly states that the ionic liquid must be present in at least 80% by weight of the composition. This limitation allows for at most 20% water by weight in the claimed compositions. Assuming that no other components of the composition are present, 20% water would not be considered by one of ordinary skill in the art to render water a “principal component” of the compositions. Kaneko, therefore, does not teach each and every element of the rejected claims. Withdrawal of the rejections of claims 27, 29-34, 61, and 64 is respectfully requested.

*Kaneko does not provide a reasonable expectation of success*

As noted above, one of ordinary skill in the relevant art must have a reasonable expectation of success in light of the cited reference(s). Importantly, the reasonable expectation of success must be found in the prior art, and may not be based on the Applicant’s disclosure.

The many differences between a solution of ions and an ionic liquid are appreciated by one of ordinary skill in the art. For example, one of ordinary skill in the art appreciates that the mere existence of an aqueous solution of two particular ions does not guarantee that the two particular ions in their neat form will display the uncommon properties of an ionic liquid. For example, a room-temperature solution of sodium chloride in water does not provide a reasonable expectation of success in preparing a room-temperature sodium chloride-based ionic liquid; one of ordinary skill in the art can appreciate this fact because there is no such room-temperature ionic liquid reported in the scientific literature.

Further, one of ordinary skill in the art would understand Kaneko's statement that having "water as the base as a principal component" (paragraph [0008]) would entail having more water present in the solution than any other single component. Kaneko repeatedly stresses the importance of water in the composition – "the image removal promotion liquid containing alkyl sulfo succinate has the *high wettability* to the image formation matter and a recorded material, *osmosis* in a recorded material arises promptly and one of the reasons alkyl sulfo succinate gives the removal property of the good image formation matter is guessed for image removal promotion liquid to permeate even the interface of the image formation matter and a recorded material especially" (paragraph [0013], emphasis added). Furthermore, "when giving the image removal promotion liquid *with which water is especially contained...* to the recorded material in large quantities, ... the component of the image removal promotion liquid given to the recorded material, *especially water*[,] weaken[s] the adhesive strength of [the] recorded material and the image formation matter..." (paragraph [0013], emphasis added). Claim 27, however, clearly states that the ionic liquid must be present in at least 70% by weight of the composition. Kaneko teaches away from the reduction of the quantity of water by stressing its importance in the compositions. It is well understood that the function of the compositions recited in Kaneko would change significantly were the quantity of water to be decreased. Furthermore, Kaneko does not provide a reasonable expectation of success in forming a hydrophobic ionic liquid, as required by independent claim 27. Accordingly, the Applicants respectfully contend that one of ordinary skill in the art would not have had a reasonable expectation of success in developing the claimed invention based on the teachings of Kaneko.

The Applicants respectfully submit that the Examiner has failed to state a *prima facie* case of obviousness for the rejected claims. Withdrawal of the rejection of claims 27, 29-34, 61, and 64 is respectfully requested.

Regarding Claims 43-49, 62, and 65

Claims 43-49, 62, and 65 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Kaneko et al. (JP08-030013). Claim 43 is an independent claim from which the remaining claims in this group depend directly or indirectly. The Applicants respectfully traverse.

To establish a *prima facie* case of obviousness, a number of criteria must be met. For example, all of the limitations of a rejected claim must be taught or suggested in the references relied upon by the Examiner; or they must be among the variations that would have been “obvious to try” to one of ordinary skill in the relevant art in light of the cited references. Moreover, one of ordinary skill in the relevant art must have a reasonable expectation of success in light of the cited reference(s). Importantly, the reasonable expectation of success must be found in the prior art, and may not be based on the Applicant’s disclosure. In re Vaeck, 947 F.2d 488, 20 U.S.P.Q. 2d 1438 (Fed. Cir. 1991); see MPEP § 2143 - § 2143.03 for decisions pertinent to each of these criteria.

*Kaneko is nonanalogous art*

Kaneko describes a method of recording and removing images from a substrate. Therefore, the reference is nonanalogous art vis-à-vis the claimed ionic liquid compositions because the reference advanced by the Examiner does not relate to “any need or problem known in the field of [ionic liquids] at the time of the invention and addressed by” the instant application. See MPEP § 2141.01(a). Furthermore, while not dispositive of an assessment of analogy, the Applicants note that Kaneko has been assigned to Int. Cl. G03G “Electrography; Electrophotography; Magnetography,” subclasses 7/00 “Selection of materials for use in image-receiving members, i.e. for reversal by physical contact; Manufacture thereof” and 21/00 “Arrangements not provided for by groups 13/00 to 19/00, e.g. cleaning, elimination of residual charge.” In stark contrast, the present application has been assigned to Int. Cl. C07C “Acyclic or carbocyclic compounds,” subclass 39/44 “Metal derivatives of a hydroxy group bound to a carbon atom of a six-membered aromatic ring.” The Patent Office classification of references can and does, in this case, provide some evidence of “nonanalogy.” See MPEP § 2141.01(a).

Further, an assessment of the similarities and differences in structure and function of the claimed invention and the teachings of the cited reference should carry even greater weight in establishing the “nonanalogy” of the cited reference. MPEP § 2141.01(a). The structural differences between the image removal liquid described in Kaneko and the compositions of the present invention are significant.

First, independent claim 43 recites a diamide-functionalized anion. Kaneko does not teach or suggest the use of amide-functionalized anions. One of ordinary skill in the art

understands well the myriad structural and functional differences between amides and esters. Amides, for example, are the most stable of all of the carbonyl-containing functional groups. Furthermore, primary and secondary amides may act both as hydrogen-bond donors and hydrogen-bond acceptors. Esters, on the other hand, have only the capability to act as hydrogen-bond acceptors. On a fundamental level, esters may undergo a variety of reactions, including the formation of alcohols, reduction to aldehydes, and the formation of amides and carboxylic acids. Of these simple transformations, amides share only the ability to be hydrolyzed to carboxylic acids. Additionally, amides have the ability to be reduced directly into amines, an capability that is not shared by an ester functional group.

Second, one of ordinary skill in the art would understand that having “water as the base as a principal component” (Kaneko, paragraph [0008]) would entail having more water present in the solution than any other single component. In contrast, rejected claim 43 states that the ionic liquid must be present in at least 70% by weight of the composition. This leaves at most 30% water by weight in the claimed compositions. Even if one assumes that the composition comprises no other components, the maximum amount water (30%) would not be considered by one of ordinary skill in the art to be the “principal component” of the claimed compositions. Additionally, the function of the claimed invention differs from that of the compositions cited in Kaneko. The problem addressed in Kaneko is that of providing an improved method and device for regenerating a material to be recorded. In contrast, the problem addressed in the present application is the discovery and manufacture of new ionic liquid compositions with water as an minority if not incidental constituent. Importantly, Kaneko stresses the importance of the presence of water in order to carry out the specific function of the image removal accelerating liquid. The requirement for lesser amounts of water in the claimed ionic liquid compositions would discourage one of skill in the art of ionic liquids from looking to Kaneko for guidance as to how to make and use the subject matter of the rejected claims.

Therefore, the Applicants respectfully contend that Kaneko is not available to the Examiner because it does not relate to analogous art. In the absence of Kaneko, the Applicants respectfully contend that the Examiner has failed to state a *prima facie* case of obviousness for the pending claims.

*Kaneko does not teach each and every element of the claimed invention*

Assuming, *arguendo*, that Kaneko is available as a prior art reference, which the Applicants do not believe to be the case, the Applicants contend that Kaneko does not teach all of the limitations of the claimed invention.

Specifically, independent claim 43 recites a diamide-functionalized anion. Kaneko does not teach or suggest the use of amide-functionalized anions. One of ordinary skill in the art understands well the myriad structural and functional differences between amides and esters. Amides, for example, are the most stable of all of the carbonyl-containing functional groups. Furthermore, primary and secondary amides may act both as hydrogen-bond donors and hydrogen-bond acceptors. Esters, on the other hand, have only the capability to act as hydrogen-bond acceptors. On a fundamental level, esters may undergo a variety of reactions, including the formation of alcohols, reduction to aldehydes, and the formation of amides and carboxylic acids. Of these simple transformations, amides share only the ability to be hydrolyzed to carboxylic acids. Additionally, amides have the ability to be reduced directly into amines, an capability that is not shared by an ester functional group. Furthermore, independent claim 43 is limited to an ionic liquid composition that melts at a temperature less than about 100 °C. Kaneko teaches solutions of ions in water; Kaneko does not teach the molten form of a salt, regardless of the melting point.

One of ordinary skill in the art would understand Kaneko's explicit requirement for having "water as the base as a principal component" would entail having more water present in the solution than any other single component. Claim 43 clearly states that the ionic liquid must be present in at least 70% by weight of the composition. This limitation leaves at most 30% water by weight in the claimed compositions. Assuming that no other components of the composition are present, the maximum amount of water (30%) that could be present would not be considered by one of ordinary skill in the art to be a "principal component" of the claimed compositions. Therefore, Kaneko explicit requirement for water as the principal component renders it lacking with respect the literal scope of the rejected claims. Moreover, because Kaneko explicitly requires that water must be the principal component of its compositions, one of ordinary skill in the art would not considered it "obvious to try" modifying Kaneko's compositions to include no more than 30% water.

Additionally, claims 46 and 49 are directed to an ionic liquid comprising 1-butyl-3-methylimidazolium. Kaneko does not teach this cation or any reasonable structural variation thereof.

Furthermore, claim 62 is directed to a composition comprising greater than 80 weight percent of the ionic liquid. The arguments made above pertaining to the effect of having at least 70 percent by weight of the ionic liquid are reiterated by reference. One of ordinary skill in the art would understand that having “water as the base as a principal component” would entail having more water present in the solution than any other single component. Claim 61 clearly states that the ionic liquid must be present in at least 80% by weight of the composition. This limitation allows for at most 20% water by weight in the claimed compositions. Assuming that no other components of the composition are present, 20% water would not be considered by one of ordinary skill in the art to render water a “principal component” of the compositions.

Kaneko, therefore, does not teach each and every element of the invention described in claim 43, and the claims that depend therefrom. The Applicants respectfully request reconsideration of the rejection based on 35 U.S.C. 103 in view of the preceding arguments.

*Kaneko does not provide a reasonable expectation of success*

As noted above, one of ordinary skill in the relevant art must have a reasonable expectation of success in light of the cited reference(s). Importantly, the reasonable expectation of success must be found in the prior art, and may not be based on the Applicant’s disclosure.

The many differences between a solution of ions and an ionic liquid are appreciated by one of ordinary skill in the art. For example, one of ordinary skill in the art appreciates that the mere existence of an aqueous solution of two particular ions does not guarantee that the two particular ions in their neat form will display the uncommon properties of an ionic liquid. For example, a room-temperature solution of sodium chloride in water does not provide a reasonable expectation of success in preparing a room-temperature sodium chloride-based ionic liquid; one of ordinary skill in the art can appreciate this fact because there is no such room-temperature ionic liquid reported in the scientific literature.



Further, one of ordinary skill in the art would understand Kaneko's statement that having "water as the base as a principal component" (paragraph [0008]) would entail having more water present in the solution than any other single component. Kaneko repeatedly stresses the importance of water in the composition – "the image removal promotion liquid containing alkyl sulfo succinate has the *high wettability* to the image formation matter and a recorded material, *osmosis* in a recorded material arises promptly and one of the reasons alkyl sulfo succinate gives the removal property of the good image formation matter is guessed for image removal promotion liquid to permeate even the interface of the image formation matter and a recorded material especially" (paragraph [0013], emphasis added). Furthermore, "when giving the image removal promotion liquid *with which water is especially contained...* to the recorded material in large quantities, ... the component of the image removal promotion liquid given to the recorded material, *especially water*[,] weaken[s] the adhesive strength of [the] recorded material and the image formation matter..." (paragraph [0013], emphasis added). Claim 43, however, clearly states that the ionic liquid must be present in at least 70% by weight of the composition. Kaneko teaches away from the reduction of the quantity of water by stressing its importance in the compositions. It is well understood that the function of the compositions recited in Kaneko would change significantly were the quantity of water to be decreased. Furthermore, Kaneko does not provide a reasonable expectation of success in forming an ionic liquid with a melting point that is less than about 100 °C, as required by independent claim 43, because Kaneko teaches solutions of ions in water, from which one of ordinary skill could not reasonably expect success in developing a molten salt with a melting point that is less than about 100 °C. Accordingly, the Applicants respectfully contend that one of ordinary skill in the art would not have had a reasonable expectation of success in developing the claimed invention based on the teachings of Kaneko.

The Applicants respectfully submit that the Examiner has failed to state a *prima facie* case of obviousness for the rejected claims. Withdrawal of the rejection of claims 43-49, 62, and 65 is respectfully requested.

### **Fees**

The Applicants believe that they have provided for any and all fees that are due in connection with the filing of this Response. Nevertheless, the Commissioner is hereby authorized to charge any additional fees due in connection with the filing of this Response to our Deposit Account, **No. 06-1448**, reference **SAX-008.01**.

### **Conclusion**

The Applicants believe that the pending claims are in condition for allowance. If a telephone conversation with Applicants' Attorney would expedite prosecution of the above-identified application, the Examiner is urged to contact the undersigned.

Respectfully submitted,  
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